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I claim:

1. An image processing apparatus for processing imaging data in a plurality of spectral bands and fusing the data into a color image, comprising:

one or more imaging sensors;

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at least two image-acquiring sensor areas located on said one or more imaging sensors, wherein each said sensor area is sensitive to a different spectral band than at least one other of said sensor areas and generates an image output representative of an acquired image in the spectral band to which the sensor area is sensitive;

a registration algorithm for scaling and registering said image outputs; and

a color fusion algorithm for combining said image outputs into a single image.

2. An apparatus as in claim 1, further comprising a frame grabber.

3. An apparatus as in claim 1, wherein said registration algorithm and said color fusion algorithm are resident programs in a central processor of a general purpose computer.

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4. An apparatus as in claim 1, further comprising a screen display.

5. An apparatus as in claim 4, further comprising an operator interface for allowing operator input in processing of said image outputs.

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6. An apparatus as in claim 1, wherein said color fusion algorithm is SCF.

7. An apparatus as in claim 1, wherein said color fusion algorithm is PCCF.

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Inventor's Names: P. Warren, J. Howard, R. Klein, J. Schuler, M. Satyshur, D. Scribner, M. Kruer

- 5 8. An apparatus as in claim 7, wherein said PCCF de-saturates said fused output image.
9. An apparatus as in claim 1, further comprising one or more additional sensors on which some of said plurality of imaging sensor areas are located.
- 10 10. An apparatus as in claim 1, wherein said apparatus is configured to acquire images in real time.
11. An apparatus as in claim 1, wherein said plurality of sensors comprises three sensors, and each said sensor is configured to map its image to an associated color channel, and wherein said algorithm is configured to combine said color channels into a color image.
12. An apparatus as in claim 11, wherein said three sensors are respectively sensitive to the visible, LWIR, and SWIR spectral bands.
- 20 13. An apparatus as in claim 1, wherein said processing and fusing of said image occurs in real time.
14. A method for producing a real-time color fused image, comprising the steps of:
- providing one or more imaging sensors including at least two image-acquiring sensor areas located on said one or more imaging sensors, wherein each said sensor area is sensitive to a
- 25 different spectral band than at least one other of said sensor areas;
- exposing said at least two sensor-areas to an image, said at least two sensor areas thereby each acquiring said image and generating and generating an image output representative of said acquired image in the spectral band to which the sensor area is sensitive;
- 30 scaling said image outputs of said sensor areas;

Inventor's Names: P. Warren, J. Howard, R. Klein, J. Schuler, M. Satyshur, D. Scribner, M. Kruer

5 registering said image outputs; and
 color fusing said image outputs into a single image.

15 15. A method as in claim 14, further comprising the step of providing a frame grabber for
acquiring said image.

10 16. A method as in claim 14, wherein said registration algorithm and said color fusion
algorithm are resident programs in a central processor of a general purpose computer.

15 17. A method as in claim 14, further comprising displaying said image outputs on a screen
display.

18. A method as in claim 17, further comprising providing an operator interface for allowing
operator input in processing of said image outputs.

20 19. A method as in claim 14, wherein said color fusing is SCF.

20. A method as in claim 14, wherein said color fusing is PCCF.

25 21. A method as in claim 14, wherein said image is acquired by three sensors, each said
sensor is configured to map its image to an associated color channel, and wherein said fusing
combines said color channels into a color image.

30 22. A method as in claim 14, wherein said three sensors are respectively sensitive to the
visible, LWIR, and SWIR spectral bands.

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PATENT APPLICATION

Inventor's Names: P. Warren, J. Howard, R. Klein, J. Schuler, M. Satyshur, D. Scribner, M. Kruer

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23. A method as in claim 14, wherein said processing and fusing of said image occurs in real time.